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ABSTRACT

Given that very little is known about the kinds of writing experiences students have in content areas beyond writing for evaluative purpose, a study investigated how writing tasks interact with learning and also how the instructional context in which writing is embedded influences what students contribute to and take from writing. The effects of three study conditions (review only, study questions, and analytic essay writing) on students' written products, reasoning processes, and measures of learning from text were examined. One teacher of American History and two of her 11th grade classes participated in: (1) a three month observational stage in which case study techniques were employed with six students to determine the typical approaches to American History utilized in the general and academic courses; and (2) an experimental stage in which 22 participating students read, wrote about and took a battery of tests on prose passages excerpted from textbooks and completed a series of read-and-study tasks, while 18 of their classmates completed the same tasks while composing aloud. Results indicated analytic writing enabled the students to tap personal knowledge and use concepts in new situations, and enabled general students to recall specific information from text at least as well as the academic students. Study questions enabled students to focus on the text in a full yet more superficial way. (Six tables of data are included, and 20 references and three appendixes are included.) (NH)

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Writing and Learning from Text: Case Studies of Process and Product

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ABSTRACT

This study examined the effects of three study conditions (review only, study questions, and analytic essay writing) on students' written products, reasoning processes, and measures of learning from text (concept application, immediate recall, delayed recall, and recall of manipulated content). One experienced Social Studies teacher and two sections (general and academic) of her eleventh grade American History course participated in the research. In the first stage of the study, observational and case study techniques were employed to determine the typical approaches to American History sponsored in the general and academic courses. In the second stage, students read, reviewed or wrote about, and were tested on prose passages. Analysis of the written products and processes indicated students' varying approaches to studying and writing about the passages. Both forms of writing enabled students in both classes to perform better on all learning measures, with the academic class out performing the general class for the most part. Analytic writing was associated with higher scores on concept application, while study questions led to better general recall in the immediate and delayed conditions. When recall was further analyzed for retention of content units manipulated (contained in the written responses) during the two writing tasks, analytic writing was associated with higher scores in the immediate and delayed conditions. More interesting was the evidence that with this more specific measure of recall, the differences in scores between the two classes disappeared in spite of the general students' limited experience with writing.

Writing and Learning from Text:
Case Studies of Process and Product

While English teachers continue to provide the primary form of writing instruction, high school students are assigned writing in other content areas, especially Social Studies. Applebee's (1981) survey of writing in the secondary school demonstrates that only in English classrooms do students write more than in Social Studies classrooms. Furthermore, the field of Social Studies Education has begun to promote writing as a way of learning (for example, see Social Education, March 1979). This trend is indeed promising in light of our assumption that effective writing programs will involve writing across the curriculum, not just in English.

However, we know very little about the kinds of writing experiences students have in content areas such as Social Studies. What we do know is that, in general, school sponsored writing almost always serves an evaluative purpose. While this use of writing has its place in teaching and learning, we also believe that writing can become a powerful means of rethinking, revising, and reformulating what one knows. To devolop a fuller understanding of how and under what conditions this might be possible, we need to not only examine how writing tasks interact with learning, but also how the instructional context in which writing is embedded may influence what students contribute to and take from writing.

Throughout high school, writing assignments in Social

Studies classes range across a variety of purposes-- from short answers exercises and reports on historical events and figures to personal responses to and analytical discussions of the social and political forces that shape history and current events. Despite their relative frequency, however, we know very little about the effects that these writing activities have on students' learning. This study investigates those effects by examining students' written responses, writing processes, and learning from three study conditions in the context of an American History classroom.

In spite of the fact that school writing tasks are usually assigned to evaluate rather than foster topic understanding, scholarly argument has begun regarding the relationship of writing and learning (Martin et al., 1976; Emig, 1977; Odell, 1980; Applebee, 1984b). Buidling on a constructivist view of language comprehension (e.g Spiro, 1980), the argument states that meaning derives from the interaction between new information (contained in textbooks and teachers' presentations) and the learner's purposes, language skills, motivation, and prior knowledge. By extension, the underlying assumption for research is that the act of composing enables students to organize and then formulate meaning from what they have tentatively construed while reading and studying.

Concurrent with the recent shift to a constructivist understanding of the relationships between writing and learning, research on reading comprehension (e.g. Spiro, 1980; Adams & Bruce, 1982) has begun to describe the act of reading as a constructive process of meaning making. "What language provides

is a skeleton, a blueprint for the creation of meaning. Such skeletal representations must then be enriched and embellished so that they conform with the understander's preexisting world views and the operative purposes of understanding at a given time" (Spiro, 1980, p.245). Most important is the role of knowledge that learners bring to the act of reading. However, writing about text may also provide a way to "enrich and embellish" what learners have tentatively taken from their reading of text.

Theoretical Orientation

How do the ways in which students write about text help shape their understanding of the information in the text? Studies in prose learning (e.g. Anderson & Biddle, 1975; Reder, 1980) suggest that information being studied tends to improve recall, and that improvement is closely related to the type of manipulation of language and ideas. However, the kinds of complex writing tasks (analytic essay writing) used in studies of the composing process differ greatly from the simpler forms of writing (short answer questions) used in prose learning research. In one of the few studies of direct effects of writing on learning, Newell (1984) examined the effects, of notetaking, short-answer study questions, and analytic essay writing on passage recall, organization of passage knowledge, and concept application. Results indicated significant differences favoring essay writing on the measure of passage knowledge but not on the other measures. Furthermore, students took significantly more time for essay writing than the other two tasks, raising the

possibility that the effects for essay writing were an artifact of more time on task rather than the nature of the tasks

Langer (1986b) and Marshall (1987) also examined the relationship of writing and learning. As part of a larger study of writing in academic classrooms (Langer & Applebee, 1987), Langer was able to demonstrate that when students wrote essays about expository text, their meaning construction process enabled them to conceptualize passage content in ways that focused on larger issues and topics as compared to notetaking and answering study questions. Langer reported that essay writing allowed students to engage in conceptually more complex thoughts than notetaking and study questions as reflected in a measure of topic-related knowledge.

In a study of writing and learning about literary texts, Marshall (1987) demonstrated that extended writing tasks (personal and formal analytic essay writing) are associated with qualitatively better literary understanding over time, and that restrictive tasks (study questions) may actually interfere with that understanding. Essay writing allowed students to elaborate upon the meaning they had generated through analysis and to generate an enduring representation of literary text.

Because the nature of instructional support also must interact with what students take from writing, Marshall examined the instructional context in which the students had discussed and written about literary text. In spite of a rather limited and limiting requirement that they learn only to respond formally (referring to textual evidence to interpret) to literature during classroom instruction, when Marshall asked the

.students to write in a more reader based or personal mode, he found that personal analytic writing was as helpful as a more formal approach. In the present study, a broad portrait of the instructional contexts of two classrooms with students of differing ability levels (academic and general) will be drawn as a backdrop against which we will examine students' performances on the various tasks under study.

In spite of the claims from studies that have looked directly at the effects of writing on acquiring new knowledge, studies of school writing (Applebee, 1981; 1984a) have consistently demonstrated that writing is rarely used to foster learning. One reason why teachers do not implement writing assignments this way is that they lack clear understanding of the kinds of learning writing might engender. Evidence from Applebee's (1984a) study of the context for writing in the secondary school indicates that less successful students may have an even more restricted range of writing experiences. Specifically, they were assigned analytic writing only about half as often as compared to better writers and English as a Second Language students. Furthermore, as Applebee (1984b) has pointed out, we need "a more rigorous conceptualization of the functions that writing can serve, each of which might be expected to have a different relationship to the development of reasoning skills" (p. 591). It was concerns such as these that prompted us to focus directly on how two different types of instructional context as well as studying and writing foster reasoning and learning about information presented in

content-area textbooks. Accordingly, three general questions directed this study of writing in an American History course and a more structured study of the effects of writing on learning:

1. What similarities and differences in approach were evident in the organization of the curricula and in the implementation of writing assignments in a general and an academic Amercan History classrooms? How did these features of the instructional context shape students' approaches to writing about American History?

2. What are the effects of three read-and-study conditions (reviewing only, responding to study questions, writing an analytic essay) on students' learning from text as measured by immediate and delayed passage recall, and application of concepts to new situations?

3. How did the three study conditions affect the nature of the students' writing processes and written responses?

Overview of the Study

Data were collected in two stages. During the first stage observational and case study techniques were employed to gather data on typical patterns of instruction in the students' American History classes. The second stage included an experimental study to examine the contrasting effects of the

three read-and-study conditions on students' understanding of information from prose passages excerpted from American History textbooks. Findings from the two stages will be reviewed separately.

School Site and the Two Classrooms

The participants in the study were one teacher of American History and two of her eleventh grade classes. During the experimental stage of the study, some of the students continued to work with us--15 from the academic class and 7 from the general class with 18 additional students (nine from each of the two classes) agreeing to compose aloud for one of the study conditions. The study was conducted in a high school near a city in the south-central United States. Roughly 1500 students attend the school.

Given the effort and fexibility required by the study, an experienced, highly respected, secondary school social studies teacher who was committed to the goals of the study was sought. After interviewing several teachers, Jane Adams, an eleventh grade teacher and department chair, was selected. Since Adams had begun reshaping her American History curriculum by including both short term writing tasks such as journal entries and long term projects such as book reviews, she had a strong interest in the goals of the study.

Another reason we selected Adams was her differing pedagogical uses of writing across her two classes. While the design of the study necessitated that the students be of an age and ability to complete the writing tasks, we were interested in

how differing instructional contexts created by the same teacher might affect the students' writing and studying processes as well as their performances on the learning measures. The academic class included students of advanced ability (level 05 in a five level phasing system) and the general class included students of average ability (a combination of levels 03 and 04). The school's assignment of the participating students to these two levels is the basis for the curriculum factor in the analysis.

Relying on Adams' advice, we selected six case study students-- three from the academic class and three from the general class to work with us as "informants" during the observational stage. While the six student agreed to be interviewed outside of class during the observational stage of the study, we decided to select six more students from each class to compose aloud on the various writing tasks at the same time that their classmates were completing the tasks during the experimental stage of the study.

The Observational Stage: Two Differing Instructional Contexts for the Study of American History

Procedures

For a period of three months, observational and case study techniques were employed to gather data on the patterns of instruction in the two classrooms. While one of the investigators observed the classes, the other investigator interviewed the six case study students and collected the written work they

completed for Jane Adams during the study.

Classroom Observations. During each visit, one of investigators sat at the back of the room taking field notes, attempting to record questions and answers when possible. When this was not possible, summarizations were made for later reconstruction. Most of the classes observed consisted of teacher-led discussions of historical events and concepts related to sections of textbook material that Adams had assigned for outside reading.

Case Study and Teacher Interviews. A second investigator interviewed each case study student twice to describe his or her responses to the instruction being observed, especially the implementation of writing assignments. After an initial interview focusing on students' general feelings and responses to routines for writing assignments that Adams had made, the discussion centered on how they had completed one specific writing task. All interviews were audiotaped for later analysis. As part of the interviews, students turned in writing that they had completed for Adams. Overall, we collected 51 pieces of assigned writing from the two classes. However, this figure represents only what the students were willing to let us see rather than a total number of the writing tasks they actually performed for Adams.

Jane Adams was interviewed twice during the project--the first time about her training and experience, her uses of writing in instruction, the development of assignments, and the forms of evaluation employed. Since the two participating classes differed in ability level, we devoted some time to

discussing the implications of the differences for her uses of writing. Near the end of the three months of the project, Adams was again interviewed to examine her perceptions of the writing assignments she had implemented--how the classes had managed the tasks, what problems the students experienced with writing, and how writing aided or impeded her instructional goals. These interviews were audiotaped and verbatim transcripts made of these talks, producing about 40 pages of text.

Data Analysis. This stage of the study generated various kinds of data, requiring a range of analyses to synthesize the findings into a coherent whole. First we did write-ups of observations and reports on what we had observed and the results of the interviews leading to portraits of each case study student and of Adams' general approaches to instruction and more specific uses of writing in that instruction. The writing samples collected from the case study students were analyzed for implied sense of audience and for the extent to which students followed Adams' directions for completing the writing assignments.

Results and Discussion

Two Approches to Discussing and Writing about American History

Adams' two classes of American History covered roughly the same content, beginning with the Civil War and ending with a look at more current issues and events. However, because the students possessed differing academic strengths and weaknesses, Adams had consciously designed and implemented each curriculum

somewhat differently. With the general class she took a more chronological approach; with the academic class she used a topical approach. Figure one presents the structure of each curriculum.

Figure One

General Class		Academic Class	
12 Week Period	Content	12 Week Period	Content
1st	Post Civil War to Turn of Century	1st	Political–Economic Development
2nd	1898-1939	2nd	Social–Cultural Development
3rd	World War II	3rd	Foreign Policy to Present

In a discussion of why she made these adjustments, Adams reported that she relied on "starting with where the students are. You have to allow for differences. Some of the general group will go on to college but not all that many. I've got enough of the material the college-bound students need. The academic class really needs to get through a lot, but I also want them to have a way to think about it all. That's why I also want a topical approach." As the school year progressed the differences between the two classes became more pronounced with the general group requiring more support for the writing assignments than she had anticipated. Nevertheless, she continued to assign writing in both classes, but as we will see her expectations and curriculum design led to quite different writing experiences.

The Types of Writing Tasks Implemented

During the three months of weekly observations in Adams' two classes, we observed the implementation of eight writing tasks, including book reviews, point-of-view essays, essay tests, summary writing, answering questions on worksheets, notetaking, and a research paper. As we discussed earlier, this range of writing tasks was not uniform across both classes. While Adams explained to us that her choices of tasks for the two classes were based on her perception of what the classes could or could not manage, a less obvious but no less real basis of her choices was that the topical approach to American History enabled her to generate tasks requiring analysis and exploration of issues. "Well, with these topics I try to consider what the students thoughts might be about... let's say, the economic problems of the country." When Adams discussed how she integrated writing into to the chronological approach she tended to focus on covering textbook material. "This group (general class) needs to write and think too. And we do. But its got to be different. They have to have a sense of the outline of history. So we try to do more things like summarizing ... and notes are useful too, you know, to keep track of what's going on."

If we examine the nature of the writing tasks Adams assigned, not as purposes for writing per se, but for instructional purposes, we find that the academic class was assigned more writing to extend and reformulate their understanding of the topic under review, while the general class

was assigned more writing to review previously covered material. For example, book reviews and research papers were assigned in the academic class and journal writing and short answer exercise were assigned in the general classs. This is not to say that Adams did not have good pedagogical reasons for these decisions; nor is one of these uses of writing more valid than the other. Based on her interactions with the general class she felt that they needed her direction and control. "They (the two classes) are doing similar things; its just that they (the general class) do more of the day-to-day, in between asignments so I can help them pick out what's important...otherwise come test time they're in big trouble." For all her concern for the success of the general class, Adams selected a rather narrow set of alternative approaches to writing and learning about American History.

A Writing Episode

Given Adams concerns about her general students' coverage of text materials and their performance on unit tests, her implementation of writing assignments in that class took on a certain form and function. Even as she attempted to move away from mere summarization to more imaginative tasks, she tended to fall back on her underlying assumptions about the capabilities of her general students and the kinds of writing they can perform. We can see how these concerns manifested themselves in a discussion typical of how she approached writing tasks.

The instructional unit out of which the writing assignment evolved focused on the plight of various groups of people living

in 19th century America. Her intention was to enable students to develop a "more objective understanding" of the issues by having them take an imaginative perspective on the material. Two days before assigning the writing task, Adams had focused on the economic and political crisis of Indians, immigrants, and farmers around the turn of the century. The writing episode occured after about 20 minutes of a teacher-led discussion. Adams listed the topics on the board from which her students were to choose. The list included the following suggestions:

1. An Indian talking about how he has been treated by the American government.
2. An Indian leader talking to his grandchild about the tribe's future.
3. A Homesteader writing a letter back home.
4. A farmer lamenting his crop failures.

The following is an excerpt from the ensuing discussion concerning how to get started with the task.

Adams: You remember when I talked to you about making a journal entry on this material? It's not a test, but I do want you to make sure you do some thinking about these four groups of people. (Pointing to the list on the board.) What I want you to do is choose two of these... the ones you prefer and write as if they are talking about their situations.

Student: What about length?

Adams: Page or two... due at the end of next week. Let's go through each of these people. (Pointing to first item.) Number one. Write as if the Indian is talking. Remember how they used Indians as pawns, broke treaties, and so on. It'll be a biased point of view. Number two. We talked about major Indian leaders. So here's what I want. Write as if you're an Indian trying to instill pride in a child. What would you say? What are some important leaders you could use --ones that we have gone over in class? Number three. You're a homesteader and writing back home, and you're letting it all out. Think especially of women. See if you can describe good and bad parts of her life. Number four. What problems do farmers face? Why do they need help? Ok, now, I'll give you some time to write these down and to get started

with writing.

(After Adams finishes presenting, she begins moving around the room talking with students about their responses.)

Adams: (Leaning over a student's shoulder, she points to his paper.) What's the difference between I-M-M and E-M?

Student: I-M-M is coming, E-M is going.

Adams: Yes.

Student: What was that? If they leave Germany, it's I-M. When in the U.S. it's E-M?

(By this time Adams has moved on to another student.)

Adams: When they arrive, natives are against them. Problems at home cause them to leave. They had trouble getting here. When they arrived, they have trouble with?

Student: Acculturation.

Adams: Yes, good! Their problem is that others were ethnocentric. We don't want our culture changed by foreigners. Immigrant were ethnocentric too in not wanting to give up old ways. Also, there was trouble with zenophobia.

Student: What?

Adams: Fear of strangers. Yes, this causes problems with assimilation. For example, if a student came from California, she might have trouble getting used to new people and their ways. There are some groups that never became assimilated till recently-- Blacks, Chinese, Japanese. Group assimilation occurs: then they do what?

Student: They become prejudiced.

Adams: Yes. It's a pattern. What about today?

Student: They have to pass tests.

Adams: If you pass tests, what do you get?

Student: Visa, resident visa.

Adams: Why did different groups immigrate?

Student: Religion, farming, revolution, land, adventure, political freedom, forced them to come.

Adams: All these reasons will exist. Why do Haitians want to

come? Why did Irish come in 1940? Why Germans?
Student: Do I have to include all those things and give reasons?
Adams: If you want a good paper.

There are two observations to be made here. One concerns the nature of the support Adams provides for the task and the second is how Sue, one of the case study students, understood the nature and purpose of the task. For the most part, the kind of prompts Adams provides tend to direct students to focus on specific terms (acculturation) and reporting information from previous discussions rather than on how to establish the personae of the characters and their perception of their experiences. This may have short-circuited Adams attempts to enable the students to reconstruct the historical information from the perspectives of the personae she had listed on the board.

Sue saw the assignments beginning two days earlier when Adams "lectured a couple of days and then gave us this assignment for our journals...we were supposed to read the chapters at night and then she'd go over the stuff in class the next day." While Adams intended the writing to be used to explore the reading from an imaginative perspective, Sue approached the task quite differently. "She usually gives us about a week to do them (journal entries); that's not good." Sue reported that she usually tried to make her journal entry immediately after Adams made the assignment-- "while the ideas are still fresh in my mind." When asked if she found this strategy helpful for this particular assignment, Sue explained

"Well, not this time. I kind've forgot what she (Adams) had said, but it has the order of the stuff in the book. I just read the book and it helps me organize it, and then I add some stuff about the Indian or whatever suffering. What's important is saying stuff from the book...that's what she's lookin' for."

In a recent article, Swanson Owens (1986) reminds us that "...like any other intelligent agent, teachers deal with complexity and competing demands by simplifying them according to some kind of rational and adaptive strategy" (pp. 94-95). Our purpose here has not been to criticize Adams' teaching or her students. While her assumptions about teaching and learning are still firmly based on the rather wide spread notion of the teacher as purveyor and students as recipients of information, it was clear to us throughout the project that her efforts were moving in the direction of change. However, for Adams, implementing writing represents a novel set of tensions between offering students opportunities for ownership over what they are to take from their reading and discussions and the need for students to be successful as measured by passing scores on her tests. When working in the context of the academic class, Adams seemed more relaxed about these tensions because of her confidence in their ability to perform well on tests. This was not the case with the general class. These students were more reluctant to write, and when they did write for Adams, she often worried about their missing information and their less than adequate control over the conventions of written English. Whether or not Sue's perceptions are correct, her comments raise the question: what are some possible alternatives? And when

these alternatives are implemented, what kinds of reasoning and reformulating are fostered and what are the intellectual consequences? We now turn to the more structured, experimental stage of the study to examine the effects of studying and writing on students' composing processes, written responses, and understanding of American History.

The Experimental Stage

Our observational work revealed that Adams' differing structure of and approach to her two classes of American History had a direct affect on how she implemented writing. With the academic class she assigned more extensive writing tasks and expected a certain degree of independent thinking, whereas with the general class she assigned shorter more restrictive tasks that enabled her to carefully monitor their preparation for unit tests. While these patterns were fairly consistent within the individual classes, it was not possible to examine what the effects of these forms of writing about history might have on students' understanding. Accordingly, to extend our examination of writing and learning about American history we developed writing tasks that would allow us to systematically study how review without writing, restricted writing (short answer exercises) and extensive writing (analytic essay writing) might affect students' reasoning about content-area materials. The central question is to what extent do these differing ways of studying and writing about text contribute to a reformulation of topic knowledge leading to new understanding?

To explore these concerns, we developed an experimental study in which 22 participating students (15 from the academic class and 7 from the general class), read, wrote about, and took a battery of tests on prose passages excerpted from American History textbooks. While these students completed a series of read-and-study tasks, 18 of their classmates completed the same

tasks while composing aloud. This allowed us to build a profile not only of what students learned, but also of how the writing and reasoning processes contributed to that learning.

Design

A repeated measure design was used with class (general and academic) as the between-subject factor and treatment (review only, short answer exercise, and analytic essay) as the within-subject factor. Thus, the design was a 2 X 3 factorial with repeated measures. Order of treatment and order of passages were counterbalanced. Each student read each of the three passages and studied the passages within each of the three conditions.

Materials

The design of the study required that students read three prose passages associated with three study conditions. Working with Adams, we selected three passages from material she had planned to employ in her ensuing instructional unit on American foreign policy and international events prior to World War II. The passages were selected not only on the basis of content but also (1) a discourse type of "analysis" (Applebee, 1981); (2) self-contained, that is, no reliance on graphics or other parts of the text; (3) a length of about 700 words to insure that students could read it with a 45 minute period. The first passage entitled "The Roots and Results of Isolationism Prior to World War II" examines American resistance to entering the war; the second passage, "The Monroe Dotrine", analyzes President

Monroe's motivation for implementing this policy and chronicles how the Doctrine helped shape foreign policy prior to World War II; "Accent on Scapegoating" explains the development of anti-semitism in Europe and the strategy behind Nazi Germany's persecution of the Jews. Appendix A provides a synopsis of one of the passages.

Instruments

Study Conditions

Three different study tasks were designed for each passage: read-and-review only, responding to study questions, and analytic essay writing. Since these assignments would enable students to interact with information contained in the passages, we anticipated that each would lead to varying levels of understanding and recall of the information.

Read and Review. In this condition students were asked to, "Study the reading passage as you usually do when you prepare for a test but do not do any writing." This condition allowed student to re-read the passages to monitor their comprehension, and it also served as a control against which to compare the effects of the two writing tasks.

Short Answer Exercise. The series of twenty questions was similar to those that students encounter at the end of textbook chapters or study guides. Each set of questions contained an even distribution of textually explicit and textually implicit questions. These types of questions capture the relationship between the question and answer, that is, between the information presented in the passage and that required for an

answer to a question. The following is an example question and response:

Question: Why did the failure of the League of Nations to stop Italy, Germany, and Japan's aggressions intensify the feelings for isolationism?

Response: It intensified because the Senate Munitions Investigating Committee started to investigate the war profits.

Analytic Writing. In this condition, students were asked to write extensively about their own interpretations and point of view relative to the reading passages. To do so they had to move beyond citing information to reformulating passage content to support and explain their understanding. The following topic was based on "The Monroe Doctrine":

> Given what you have learned from the passage, what do you feel were the two or three most important reasons for the United States developing the Monroe Doctrine? Be sure to use the information from the passage to explain your ideas.

Learning Measures

Two instruments were designed to examine what students had learned while reading and studying the passages.

Application of Concepts

When the students completed each study task, they wrote a paragraph length answer to each of three concept application questions. (One for each of the three most important concepts in each passage.) To establish reliability for selecting the concepts, we followed a set of guidelines to select words/phrases from the top half of each passage's content structure (Meyer, 1975). Percent of

agreement in selecting the concepts was 75 percent. When disagreement occured, consensus was reached through discussion. The three application questions required the students to apply the concepts to new situations and to organize their responses coherently. The questions were administered immediately after students read and studied a passage.

Students' responses were scored by means of holistic reading on a scale of 0 to 5. Scoring was based on two dimensions: (1) evidence for understanding the target concept; (2) ability to support a point of view in a cogent way. Appendix B provides the scoring guide. Each response was scored twice by two raters. To obtain scores for each study condition, each of the three scores were summmed. Interrater reliability for the concept application measure was .79.

Passage Recall

To measure students' understanding of the passages, they were asked to, "Write down all that you can remember about the passage you just read." Each recall protocol was scored for number of T-units (Hunt, 1977). Then, to compare the information with the recall tasks to the original passages, the passages were analyzed for hierarchical structuring of information using an adaptation of Meyer's (1975, 1981) prose analysis system. Each passage was divided into sequentially numbered T-units, which were then analyzed for their rhetorical relationships to other information in the passage. For example, content units at level two in the hierarchy are more central to the major principles in the passages than those at levels five and six. Those lower levels represent elaborations and explanations of the theme of the passage. Using the content structure, we worked

content unit by content unit to analyze students' responses during both the writing and recall tasks. A content unit was scored as "included" if any of the central ideas from the original T-unit appeared anywhere in the writing or recall protocol.

In addition to a general recall of the passages, procedures from Langer and Applebee (1987) were employed to examine the effects of various types of content manipulation fostered by the two writing tasks. This concern for more specific effects of writing on learning evolved out of earlier studies by Newell (1984; and Winograd, in review) which suggested that specific tasks lead to specific kinds of reasoning, and, consequently, to qualitatively different learning. Accordingly, we subdivided the content units included in students' written recalls into content units manipulated (included in the responses to the study questions and essay assignments) and content units recalled (content units from the original passages included in the written recalls). The latter were further analyzed for their inclusion in the written responses and thus manipulated during the writing task.

Examining Task Characteristics: Products and Processes

To explore the nature of the two writing tasks, we analyzed the written responses for content units contained in the original passage (described above) and for various types of length. Additionally, we traced the differing effects of the three study conditions on students' writing and reasoning processes using a modified version of Langer's (1986a) and Marshall's (1987) systems for coding think aloud data.

Length of Written Responses to Study Questions and Analytic

Writing. Total words, T-units, and words per T-unit (Hunt, 1977) were calculated for all the writing collected during the experimental portion of the study.

Analysis of the Think-Aloud Protocols. To analyze the composing processes engendered by the three read-and-study conditions, transcribed protocols were segmented into T-units or communication units (identifiable remarks about a thought or behavior); each unit was then coded for Strategies (phases of meaning making such as generating, refining, evaluating, and revising), Focus (the students' awareness of processes or concerns for the emerging text under consideration whether written or held in memory only (review only condition)), and Reasoning Processes (restating information, interpreting, planning, decision making). Appendix C provides coding definitions.

We transcribed each think-aloud in T-Units or communication units and then analyzed each unit three times, once each for the three dimensions. A scoring guide provided definitions of the subcategories and examples units for each. In this report, we will review only the results for reasoning strategies.

Procedures

Data collection for the experimental phase ran for a two week period and followed a regular pattern. On the first day, students received a packet containing directions for reading and studying the passage in one of the three conditions. The next day they received another packet containing directions to recall the passage and to respond to questions requiring concept application. On the third and fourth days and again on the fifth and sixth days they went through

the same process with the passage and study condition changing each time. Then one week later they repeated the recall of the passages.

For each session, the students and one of the investigators met in a room adjacent to Adams' classroom during the regular class time for American History. At the beginning of the session, the investigator reviewed what they would be doing, and then distributed packets containing a passage and writing assignment. Students were able to refer to the passage in completing the assignments. For each study session, students had a full 50 minute period in which to work.

Over approximately the same period of time that their classmates completed the writing assignments, 18 case study students met with a team of investigators to complete the same assignments while composing aloud. Previous to these sessions, we trained the case study students in the think-aloud technique. Like their classmates, these students received a packet the first day, and completed the read-and-study assignment; like them they returned the next day to complete the application and recall tests. One week later they repeated the recall test with their classmates. At each think-aloud session, they were given a copy of a passage and an assignment. As they reviewed or wrote about the passage, they were reminded to say aloud into a tape recorder everything they were thinking, reading, and writing as the tape recorder ran.

Due to the additional constraints under which these 18 case study students completed the tasks, their writing and their

posttests were analyzed seperately. In the context of this report, discussion of results of tasks performed by these students is confined to patterns of thinking and reasoning fostered by the writing tasks.

The Experimetal Data

Data collected during the experimental stage included the written responses to questions and essay assignments (44 samples), tests of learning from text (66 immediate recalls, 66 delayed recalls, and 66 application tests), and 18 composing aloud protocols. Data from the composing aloud sessions were not included in the analysis of group results. These data are presented descriptively to construct a profile of the writing and reasoning employed by students while reviewing and writing about the passages.

Results and Discussion

Writing and Reasoning Processes

Assuming that the three study conditions required different approaches to writing and learning from the passages, we examined the 18 think-aloud protocols for reasoning operations. To piece together the students' thinking processes as they reviewed or wrote, the 18 protocols were analyzed using an instrument developed by Langer (1986). With some modifications, we employed the instrument to examine the proportion of reasoning operations students verbalized as they approached and completed studying the passages in the three conditions.

Length of Protocols

Results for length are displayed in Table 1. As we expected, protocols for the two writing tasks were generally longer than the review conditions. One notable exception is essay writing for students from the general class, which led to considerably shorter protocols relative to the academic class. Students in the academic class verbalized more in the three conditions than student from the general class.

Insert Table 1 here.

Reasoning Operations

To determine the nature of the reasoning operations in which students engaged as they approached the study conditions, we coded the think aloud protocols into one of the 13 subcategories of operations, then collapsed these into four major categories. For our purposes here, we will foucus on 1)Examination of Text (reading the passage and searching for a way to rephrase it, for an answer, or for evidence); 2) Constructing Meaning (rephrasing, summarizing, or interpreting); 3) Decision Making (planning, evaluating, reformulating); and 4) Monitoring (metacomments reflecting appraisal and progression in the activity). We would expect the review-only and short answer conditions to lead to more frequent examinations of text, and the essay writing to more planning, evaluating, and reformulating

Table 2 presents mean percentages within each of the four categories. The review-only condition led students to verbalize operations that reflect the construction of meaning nearly half the time (43.8 percent). However, 30.3 percent of those operations entailed restating or rephrasing the passage, suggesting a limited opportunity to acquire an overall sense of the central issues or major principles in the passages. Charles' think-aloud while reviewing "The Monroe Doctrine" indicates a certain lack of focus fostered by this activity.

> While on the face of it a declaration of withdrawl from European affairs, the Monroe Doctrine was really a commitment modified over time. Well, that sounds like something changed... It was an important thing for, let's see, international affairs...the most significant of all American papers, it says here. When was the doctrine written? Where's a date that could help me figure this?

Insert Table 2 here.

In general, the review-only condition which lacks the focus provided by writing led students to rephrase part of the text, then move to peripherally related issues. When they did attempt to rephrase or summarize, then did so superficially.

To complete the study questions, students examined the text a full 57.1 percent of the time. This seemed to result from their need to read and restate the question, scan the passage, and develop a response. Bill's think aloud for study questions began like this:

> Why were Jews unable to attain political power and influence government policy to make things better for themselves in Germany? Uh, referring back to uh page... let's see, the reason the Jewish population

> ... were unable to attain political power should be... let's see, because of religious animosities. Number two.

As students responded to questions, they focused almost exclusively on the passage, moving to a construction of an answer through restating of passage information. Once they located correct information, they copied it and rarely returned to rethink their responses. This resulted in a rather fragmented manipulation of the the passage content as they had no need to revise or discover relationships across the twenty questions.

In comparison, when student engaged in analytic writing, they distributed their time more evenly across the four operations. As they looked back to the passage, it was to search for evidence to substantiate their ideas (as opposed to simply transcribing information) and to elaborate their own interpretations. They were more likely to make the information their own. While they relied somewhat less on passage content in this condition (39 percent) relative to the question condition (57.1 percent), they worked more extensively with passage content as indicated by the percentage of operations for constructing meaning (25 percent) and decision making (29.2 percent).

After selecting major points of focus for her essay, Mary begins her essay on the Monroe Doctrine.

> Uhm, I'm gonna first write an introductory paragraph and try and pull the three topic sentences together in a way that I can break them into three separate paragraphs...for many important reasons, for many reasons... three very important ones were designed to stop ... no, scratch that, put into... to stop letting American, Uhm, colonization and to stop Russian expansion. Got to keep thinking about fitting this together. Now, to another point here. Let's see.

The nature of this planning is qualitatively diferent from the planning in the study question condition. Mary's plans are illustrative of how essay writing encouraged students' plans to combine a local and global dimension. This may have led to a more integrated comprehension of the passage. While that understanding may have been limited to a more narrow segment of the passsage, the students' understanding tended to be contructed as they linked their knowledge and the passage content, and then reformulated that understanding by reviewing and then evaluating their evolving text.

Thus far we have focused only how the three study conditions required the students to verbalized reasoning operations without considering how the students' differing writing experiences in the two classes might have affected their thinking about the passages. Given the rather unique features of essay writing as we discussed above, this discussion will examine the general and academic students' reasoning during analytic writing. Table 2 contains the percentage of reasoning operations for the essay condition across the two classes.

While the general and academic students verbalized operations for examining text about as often, they differed somewhat across the other three categories of reasoning. The general students tended to make more remarks within the category of constructing meaning (30 percent), but a closer look reveals that about 20 percent of those statements focused on restating passage content. Academic students tended to verbalize more decision making and monitoring remarks. These differences in the analytic writing condition are suggestive of our earlier discussion that revealed how the curriculum changed in the two classes, with the general class assigned more

teacher-monitored, more restrictive tasks designed to lead them to information contained in unit tests.

The Written Products

To gain yet another perspective on how students approached the tasks, we analyzed students' responses to the questions and essay writing assignments for length and proportion of content units mentioned in the response. Results for features of the two tasks are presented in Table 3.

Insert Table 3 here.

Length

In terms of number of words, the students did more writing when asked to write an essay, although not significantly more. Because the questions could often be answered in abbreviated manner, using words in the question stem, word count may not offer an appropriate indication of how the tasks engaged students with passage content. However, the percentage of content units referred to in the responses offers a different picture. Answers to questions included a significantly higher ($p < .001$) percentage of content units (37 percent) than did the students' essays (24.7 percent).

These data dovetail with the results of the reasoning operations in that study questions allowed students to spread their attention over a wider area of passage content, while analytic writing limited them to a more narrow set of information. Analytic writing also led to a more complex syntax than responses to questions ($p < .001$) suggesting that with analytic writing student responses were integrated, and linked

ideas with greater complexity than the responses to questions. These results seem compatible with our assumption that analytic writing requires an interpretation and marshalling evidence in its support, that leads to more complex manipulation of passage content. The effects of these contrasting approaches will become evident in our discussion of writing and learning from text which follows.

Learning from Text

We have reviewed how Adams' two classes typically wrote about American History, and we have seen how three different study conditions affect student reasoning and writing processes. By comparing an extensive task with a more restrictive task, we also examined how these two approaches affected written responses. Thus far we have built a profile that suggests that essay writing requires a rather thorough manipulation of a limited amount of passage content, study questions allow students to manipulate superficially a broader spectrum of content, and review-only leads students to mere restating of passage material with little focus or direction. But there remains the more compelling question of whether these variations in study conditions are related to learning from text. We can also ask how the instructional context for students' writing experiences might affect what students take from studying and writing about text?

To explore these questions, Adams' students were given two kinds of tests on the passages they read. While application was given only immediately after the reading and writing session,

students wrote recalls of the passages at two different time intervals.

Concept Application

Results for concept application are displayed in Table 4. This measure was the quality of responses that students generated as they applied the most important concepts from the passages to new situations or problems. There was a significant main effect for task ($p < .001$), and for class ($p < .001$), but no significant interactions. The tasks involving writing led to better applications than did the review-only condition, with the academic students performing better than the general students. Analytic writing in particular provided students with a way to conceptualize an understanding of the more important concepts in the passage, and then to use the concepts to formulate a well-constructed response to questions requiring knowledge and experience beyong the content of the passages.

Insert Table 4 here.

That academic students performed better than the general students on concept application measure is not surprising given their experience with more extensive writing, not only in their American History class but throughout the school's curriculum. Given their more academic program, these students had more opportunity to tap a wider and richer set of background knowledge and experience called for in the application questions.

Content Units Recalled

To test the relationship between what students did during the study conditions and what they remembered later, we asked them to complete written immediate and written delayed recalls of the passages. In a previous study, Newell and Winograd (in review) demonstrated that the type of passage information recalled may be determined by the nature of the manipulation. Put another way, rather than a general effect on learning, the nature of the writing task shapes what students will remember. To extend this notion, we explored two questions: 1) were students more likely to remember information they included in their responses to questions than in the essay assignment? 2) which of the three study conditions would allow students to remember passage information for a longer period of time? These questions are especially important as we conceptualize how and why writing contributes to reasoning and learning in academic classrooms.

Table 5 summarizes the patterns of recall of content units in the immediate posttest condition. There was an overall significant effect for task ($p < .05$) with tasks involving writing leading to better recall than the review-only condition. The study question condition led to better recall than analytic writing. However, recall of content units manipulated was affected by the nature of the condition with analytic writing allowing for better retention of content units manipulated (79.7 percent) than study questions (53.3 percent).

Insert Table 5 here.

These patterns of recall were stable even at the end of one week (Table 6). Overall recall dropped from 18.6 percent in the immediate condition to 13.5 percent in the delayed condition with the two writing conditions continuing to do better than the review-only condition. The strongest effects continued to be associated with manipulation of content units with study questions leading to 50.5 percent recall and analytic writing to 73.5 percent recall.

Insert Table 6 here.

Our examination of the effect of the type of writing context or class the students attended led to a rather surprising finding. While there was a main effect for class favoring the academic students on general recall in both the immediate ($p < .01$) and delayed ($p < .05$) conditions, the effect for class disappeared when we took into account whether content units were included in the responses to the study questions and the analytic writing. The manipulation of content allowed the general students to remember the information as consistently as the academic students. This finding suggests that reasoning about content-area information during writing benefits students regardless of academic ability. It may be that in spite of the general students' less successful performances in academic settings and their limited experiences with more extensive writing they learned from text as well as their more

academically successful peers. This finding has important implications for future research.

Conclusions

The analyses we have reported here had three purposes: 1) to examine how writing activities sponsored by an eleventh grade American History teacher differed across general and academic classrooms might affect how students approach three read and study conditions; 2) to explore patterns in the students' writing and reasoning and written products when they studied and wrote about American History in the three conditions; 3) to investigate the effect of the three study conditions on students' ability to develop coherent and well elaborated responses to questions of concept application and on immediate and delayed recall of prose passages.

As previous studies (Newell, 1984; Newell & Winograd, in review; Langer, 1986b; Marshall, 1987; and Langer & Applebee, 1987) have demonstrated, the results suggest the considerable advantage that writing, whether restrictive or extensive, offers students as a way to learn from text in comparison to studying without writing. More important is the evidence that compared to their more academically successful peers, less successful students benefited equally from writing when they took the opportunity to manipulate specific content from the passages. As we saw from the observational stage of the study, the rather tightly controlled chronological approach to American History left the general students with little opportunity to use writing to think and explore beyond the information given. Even when

Adams implemented an imaginative task of point-of-view, she seemed more interested in the facts to be cited than a true exploration of the historical figures. Sue, one of the students in the general class, reported that her real task was to follow Adams' lectures and the textbook presentation carefully, collect the correct information, and then report it in the point-of-view essay.

Given these patterns, we posed the question: how might the students in the two classes write and reason in study conditions that resembled what they had experienced during Adams' instruction as well as a more analytic task? Both study questions and analytic writing enabled the students to perform better on posttests of concept application and recall than the review-only condition. Yet results from the analysis of the think-aloud protocols revealed that analytic writing allowed students to interpret and reformulate passage content into an organic whole, while study questions led to a more fragmented recital of specific answers. These processes eventually enabled students to perform differently on the two different posttests. With application, analytic writing provided students with a way to tap their knowledge and experience with Social Studies issues and subsequently to produce qualitatively better responses. With recall, study questions allowed students to include a wide spectrum of information in their responses and this seemed to contribute to superior general recall of content in both immediate and delayed conditions. While the academic students performed significantly better than the general students on general recall, the general class was able to take equal

advantage of the analytic writing when we examined the effects of the two writing tasks on the specific content manipulated.

What do these results suggest about the role of writing in secondary school classrooms? Results from our analysis of think-aloud protocols corroborate that some tasks, especially those including writing, lead students to more complex manipulations of the material. And when the students, even those considered less successful academically, used writing, they benefited equally from it. Where does this leave us? Again, we have firm evidence that writing aids learning, but writing tasks have selective benefits. As teachers, we need to consider what kinds of learning we seek in our students. In the context of this study, analytic writing enabled the students to tap personal knowledge and to use concepts in new situations. And this type of writing task enabled the general students to recall specific information from text at least as well as the academic students. Study questions enabled students to focus on the text in a full yet more superficial way. Both types of writing have a place in classrooms, regardless of ability level. The teacher's craft is to select tasks that will benefit students relative to the goals of instruction.

References

Adams, M. & Bruce, B. (1982). Background knowledge and reading comprehension, In J. A. Langer & M. T. Smith Burke (Eds.), Reader Meets author: Bridging the gap. (pp. 2-25). Newark, DE: International Reading Association.

Applebee, A. N. (1981), Writing in the secondary school. Urbana, IL: National Council of Teachers of English.

Applebee, A. N. (1984a). Contexts for learning to write. Norwood, N.J.: ABLEX.

Applebee, A. N. (1984b). Writing and reasoning. Review of Educational Research, 54 (4), 577-596

Anderson, R. C. & Biddle, W. B. (1975) On asking people questions about what they are reading. In G. Bower (Ed.), Psychology of learning and motivation (Vol.9). New York: Academic Press.

Emig, J. (1977). Writing as a mode of learning. College Composition and Communication. 28. 122-127.

Hunt, K. W. (1977). Early blooming and late-blooming syntactic structures. In C. R. Cooper & L. Odell Evaluating Writing. Urbana, IL: National Council of Teachers of English.

Langer, J. A. (1986a). Children reading and writing : structures and strategies. Norwood, N. J.: ABLEX.

Langer, J. A. (1986b). Learning through writing: Study skills in the content areas. Journal of reading, 27 (4), 400-4-6.

Langer, J. & Applebee, A. (1987). How writing shapes thinking: A Study of teaching and learning. (Research Report no. 22). Urbana, IL: National Council of Teachers of English.

Marshall, J. D. (1987). The effects of writing on students' understanding of literary texts. Research in the Teaching of English, 21 (1) 30-63.

Martin, N.; D'Arcy, P.; Newton, B.; & Parker, P. (1976) Writing and Learning Across the Curriculum 11-16. Montclair, N. J.: Boynton/Cook Publishers, Inc.

Meyer, B. F. (1975). The organization of prose and its effects on memory Amsterdam: North Holland.

Meyer, B. F. (1981). Prose analysis: Procedures, purposes, and problems. Department of Educational Psychology, College of Education, Arizona State University.

Newell, G. (1984) Learning from Writing in Two Content Areas: A Case Study/Protocol Analysis. Research in the Teaching of English, 18, (3), 265-287.

Newell, G. E. & Winograd P. (in review). The effects of writing on learning from expository text.

Odell, L. (1980). The process of writing and the process of learning. College Composition and Communication. 31, 42-50.

Reder, L. M. (1980). The role of elaboration in the comprehension and retention of prose: A critical review. Review of Educational Research. 56 (1), 5-53.

Spiro R. (1980). Constructive processes in prose comprehension and recall. In R. Spiro & W. Brewer (Eds.), Theoretical issues in reading comprehension (pp. 245-278). Hillsdale, N.J.: Erlbaum.

Swanson-Owens, D. (1986). Identifying Natural Sources of Resistance: A case study of implementing writing across the curriculum. Research in the Teaching of English, 20(1), 69-97.

TABLE 1

Length of Protocols

	Task					
	Review		Questions		Analytic	
Class:	General	Academic	General	Academic	General	Academic
M	39.0	56.3	70.3	84.7	50.3	85.3
(SD)	(24.8)	(26.7)	(54.6)	(46.4)	(14.6)	(6.8)

TABLE 2

Writing Processes: Reasoning

	Task					
	Review		Questions		Analytic	
Class:	General	Academic	General	Academic	General	Academic
Examining Text M (SD)	42.3 (11.3)	11.6 (6.6)	62.6 (15.9)	51.6 (8.3)	38.0 (34.1)	39.6 (6.24)
Construct- ing Meaning M (SD)	34.3 (17.0)	53.3 (23.3)	17.3 (15.5)	23.0 (8.7)	30.0 (25.6)	20.0 (7.5)
Decision Making M (SD)	7.3 (5.9)	29.3 (25.4)	5.0 (8.7)	7.6 (8.1)	23.0 (8.7)	35.3 (5.7)
Monitoring M (SD)	20.3 (6.5)	13.0 (1.0)	15.0 (7.8)	17.0 (6.08)	9.3 (7.21)	16.6 (0.6)

TABLE 3

Features of the Two Writing Conditions

	Task		Class	
	Questions	Analytic	General N = 7	Academic (N = 15)
Words M	189.3	243.1	166.3	239.5
(SD)	(119.5)	(67.7)	(84.7)	(98.9)
T-Units M	16.3	14.3	11.3	17.2
(SD)	(8.6)	(5.3)	(4.8)	(7.3)
Words/ M T-Unit (SD)	11.04 (3.3)	17.8 (3.4)	14.4 (4.8)	14.4 (4.4)
Content Units M Included (SD)	37.0 (11.8)	24.7 (11.1)	27.5 (16.8)	32.6 (10.6)
(%)				

Analysis of Variance for Task and Class Effects

	Task			Class			Interaction		
	df	F	P	df	F	P	df	F	P
Variables									
Words	1,20	3.19	.08	1,20	5.70	.02	1,20	0.01	.90
T-Units	1,20	0.59	.45	1,20	8.38	.008**	1,20	0.07	.78
Words/ T-Units	1,20	38.59	.001***	1,20	0.01	.96	1,20	0.13	.72
Content Units	1,20	14.23	.001***	1,20	2.47	.13	1,20	3.21	.08

* $p < .05$; ** $p < .01$; *** $p < .001$

TABLE 4

CONCEPT APPLICATION

	Means (SD)						F-Statistics		
TASK:	Review		Questions		Analytic		Task	Class	Interaction
CLASS:	General	Academic	General	Academic	General	Academic	F(2,19)	F(1,20)	F(2,19)
	6.2	7.5	4.8	8.3	10.3	11.4	11.83**	9.22**	1.61
	(2.1)	(3.3)	(2.5)	(2.9)	(2.6)	(2.3)			

**p < .001

TABLE 5

RECALL OF PASSAGE CONTENT: IMMEDIATE POSTTEST

	Mean Percent (SD)						F-Statistics		
TASK:	Review		Questions		Analytic		Task	Class	Interaction
							F(2,19)	F(1,20)	F(2,19)
CLASS:	General	Academic	General	Academic	General	Academic			
	9.6	15.6	17.1	34.1	13.9	21.5	4.87*	8.10**	0.88
	(5.0)	(19.4)	(9.4)	(20.8)	(4.0)	(1.40)			
Manipulated	--	--	54.1	52.5	82.3	77.0	16.33***	0.36	0.08
and Recalled	--	--	(27.6)	(17.8)	(23.7)	(11.7)			

*p < .05; **p < .01; *** p < .001

TABLE 6

RECALL OF PASSAGE CONTENT: DELAYED POSTTEST

	Mean Percent (SD)						F-Statistics		
TASK:	Review		Questions		Analytic		Task	Class	Interaction
							F(2,19)	F(1,20)	F(2,19)
CLASS:	General	Academic	General	Academic	General	Academic			
	2.07	7.88	10.6	31.2	13.8	15.8	28.8***	7.74*	6.04
	(2.2)	(4.1)	(9.2)	(20.0)	(6.7)	(15.2)			
manipulated	--	--	47.2	53.9	75.2	71.7	18.6***	0.65	2.74
and recalled	--	--	(24.7)	(19.9)	(12.2)	(17.2)			

* $p < .05$
*** $p < .001$

Appendix A

Synopsis: "The Monroe Doctorine"

While on its face a declaration of withdrawl from European affairs, the Monroe Doctrine was really a commitment, modified over the course of time and extended to meet changing circumstances. Constituting the classic definition of the role of the United States in international affairs, it has been called the most significant of all American state papers. To prevent European colonization in the Western Hemisphere, the doctrine warned that "American continents are not to be considered a subject for future colonization by an European power." President Monroe's warning was an attempt to halt Russian expansionism, but he also promised that the United States was not to interfere in the internal affairs of European powers. The Monroe Doctrine did not have much influence on Europe at the time of its declaration but over the course of history it evolved to become a famous statement of great historical significance. It indicated that the United States no longer operated in Britain's shadow but was a sovereign nation.

Appendix B

Scoring System for Concept Application

In coding answers, we are looking for two things: 1) proof that the student has sufficient understanding of a target concept to apply it to the specific situation provided by the question, and 2) the student's ability to support a point of view in a cogent fashion in the written response. Understanding of the concept may be demonstrated explicitly or implied through the reasoning of the answer taken as a whole. Understanding of the target concept and support will be coded according to the following scale.

0. No response.

1. Incorrect application of the concept. Student clearly misunderstands concept or answers wrong question regardless of degree of support.
   E.g. (sovereignty) "Yes and no, Why? Some countries whose governor or president rules and runs his citizens' lives is the type of country whose people should have sovereignty but those countries whom are helpless, homeless, and foodless should be run by presidents or governors to supply the needy and the ones who can't take care of themselves with care."

2. Insufficient or confused application of concept. Judging from the language of the answer, it is unclear whether the student really has understanding of the concept. Either the student does not provide adequate proof of understanding or there are internal inconsistencies demonstrating confusion about the concept.
   E.g. (sovereignty) "I think all countries should have sovereignty. If the U.S. had no sovereignty then it would be like Russia where one man controls us all and I think that the people should run their own country and not just one person, or group, or another country run it for them."

3. Correct application of concept/weak or shallow support demonstrating little depth of understanding or ability to elaborate. Support may include a reason that is poorly developed or may stick to the wording of the questions showing no personal interpretation of the question.
   E.g. (scapegoating) "Yes, the U.S. government blames many of our problems on the illegal aliens coming into the country. Everyday you hear of problems with unemployment among Americans because of the aliens. The fact is that if (?) why doesn't America do something about it if it is so much trouble."

4. Correct application of concept/adequate support. Student responds to specific application and provides at least one appropriate and well-elaborated reason to support the selected point of view. Response has a sense of logic.
   E.g. (nationalism) "The sports announcers are Americans and they are broadcasting to the American public. They have the right to say whatever they want to a point. Other countries have their own announcers that should speak mainly on their countries."

5. Correct application of concept/well elaborated support demonstrating strong understanding. The student really "owns" this concept and can respond with confidence presenting well organized interpretation using several instances for support. The response reads like a brief, well-formulated essay.
   E.g. (colonization) "In the short term sense it would because the colonized country would be able to trade with the parent country. However, in the long run the colony would begin to decline in its ability to maintain its economy. This has been proven in the past by the English colonies in America and by the Spanish colonies. In both cases, the colonies were stripped of there resources (by selling at a low price) and the products from those resources were sold back to them (the price of the products were much higher than the resources.)"

Appendix C

Reasoning Operations: Coding System

Examining Text

1. reading: either from target text or written text,
2. searching text,

Constructing Meaning

3. restating or summarizing,
4. interpreting: "seems like this was a statement by the U.S. that they were really stronger."
5. providing evidence, supporting, instantiating,
6. linking or using schema - connecting ideas from text with prior knowledge, putting several ideas together, drawing on memory, generalizing,

Decision Making

7. planning, organizing: "First I'll write down a couple main points."
8. evaluating: judging the quality of what is being read or written; e.g. "that's not what I wanted to say."
9. reformulating: recognizing a problem in a previously stated idea, opinion or piece of evidence and changing it,
10. validating: "That's it . . . that's what I want to say."

Monitoring

11. monitoring task demands: "I'd better start writing quickly."
12. monitoring mechanical, lexical and structural aspects: "two sentences is enough for a paragraph."
13. questioning and/or monitoring meaning: uncertainties stated by the writer; e.g., "Hmmm is that what it's talking about?"